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ABSTRACT

This two-phase study of the use of networks and information retrieval systems by schools in Australia was designed to inquire as to the extent that schools are using all available networks; how appropriate and effective these sources of information are for schools; how costly such services might be; and what developments can be reasonably expected in the near future that will impact on schools. Data were gathered via a documentary analysis of promotional material and other relevant material pertaining to the networks and information systems; discussions with individuals involved with the school usage of such services, e.g., teachers, principals, librarians, and, where possible, students; and discussions with representatives of service providers. Following an executive summary and a brief introduction, the report includes: (1) a description of the project methodology; (2) a report of the findings of both phases of the project; (3) a brief discussion of the representativeness of the sample used and comments on specific networks; (4) conclusions reached concerning funding, expense, availability, suitability, representativeness, rationales for and against use of networking and information systems in schools, and teacher training; and (5) recommendations on the role of school libraries, standardization, further research needs, extension of current ASCIS services, bulletin board systems, and commercial sponsorships. Also included are a glossary of terms and 30 references, and a list of the sources of information for the study is appended. (EW)

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FINAL REPORT

STUDY OF SCHOOL USE OF NETWORKS AND INFORMATION RETRIEVAL SYSTEMS

For

AUSTRALIAN LIBRARIES AND INFORMATION COUNCIL
(ALIC)

by

NICHOLAS CLARK AND ASSOCIATES
Management Consultants

428 St Kilda Road, Melbourne 3004, (03) 267 4777
42-44 Corinna Street, Woden, ACT 2606 (062) 82 4811
11th Floor, 19 Pitt Street, Sydney (02) 233 1788

Study Team:
Dr. Bruce Johnson
Dr. Colin Sharp

FEBRUARY, 1987

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EXECUTIVE SUMMARY

This report is submitted by Nicholas Clark and Associates as a statement of the methodology, findings and conclusions of the study of school use of networks and information retrieval systems, for the Australian Libraries and Information Council (ALIC).

The purposes of the study were to inquire as to:

- what extent schools are using all available information networks and how appropriate and effective are these sources of information for schools;
- how costly such services might be and what developments can be reasonably expected in the near future to impact on schools?

SCOPE OF THE STUDY

Electronic networks and information retrieval systems encompass a wide range of services and technologies, such as telecommunications, computer electronic mail and bulletin board software, communication ports and modems. Apart from these communication oriented systems there are the storage oriented systems such as computer databases, compact audio disk and videodisk media.

It was not possible for the present study to be comprehensive in these fields. Instead, the intention was to gain an overview of the developments available to schools and insight into the implications of these developments as seen by selected users.

This project was not an evaluation of services but rather a general overview of various services and an insight into their appropriateness and capacity to meet the information needs of schools.

METHODOLOGY

The project involved the following steps (which are elaborated in Chapter 2):

- Examination of the type, extent, and appropriateness of existing networks that are used by government and non-government schools.

- Analysis of the perceived advantages and disadvantages or limitations of these systems and networks.

- Identification of ways to improve the use of and access to networks and information systems available or likely to be developed in the near future.

There were two phases of the project, as follows:

Phase 1: Consultation with stakeholders to discover: Availability, Suitability, Representativeness, Rationale of the use of electronic information retrieval and networking in schools.

Phase 2: Verification and Interpretation of Information Obtained in Phase 1 by informal survey of selected users and providers; and by identification of possible solutions and examination of the need for further research.

Implementation of the Method

In general the study encompassed:

- documentary analysis of promotional material, and other relevant material pertaining to networks, and information systems;

- discussions with individuals involved with the school usage of such services, e.g., teachers, principals, librarians and where possible, students;

- discussions with representatives of service providers.

CONCLUSIONS

From the information gathered (see Chapter 3) and discussions with stakeholders the following conclusions were drawn (see further discussion in Chapters 4 and 5).

Funding

It is obvious that this study was conducted at an important time in the development of computer networking and information retrieval in schools, coinciding with the cessation of the Schools Commission funding for the computer education and staff development programmes (see Section 5.1; Appendix II D.4). A number of interviewees commented on the possible deleterious effects that would ensue because of the discontinuation of the funding. Especially important is the impact this will have in two areas:

- Teacher training and staff development (see also Section 5.6)
- Computer networking

Expense

A number of contributors (from both the public and the private school systems) referred to the costs (see Section 3 and 5.1) of the computer networks and information retrieval systems as the main factor limiting their usefulness to schools (see Walter, 1986).

Availability

There are at least four national networks currently operating which are available even in some of the remote High Schools of NT and northern NSW; (see Table 4, Section 4.2).

- AUSINET which also provides the databases, ASCIS and AEI;
- MINERVA which has been used by schools in NT and Tasmania;
- TELEMEMO which provides the preferred network for NSW distance education unit (420 students on-line);
- VIATEL with the closed user group EDUTEL which is readily accessible with little computer equipment (however, it does not have a large number of users).

Despite these services being on the market, availability to schools is limited by the following factors:

- availability of telephones for school libraries is very restricted. Even if a phone is connected it often is often not available for the on-line dial-up because of the demand for other uses during school hours;

- availability of teacher time is restricted, as most teacher/librarians seem to be employed less than half-time;

- costs are the main deterent of school use even for ASCIS which is highly subsidised.

Suitability

There is no question that electronic mail services (eg. Telememo) are suitable and appropriate for distance education (see section 4.2).

ASCIS and the value-added services like ACIN are relevant and well appreciated by all consulted. However, there are some occasional miss-matches with particular needs. For example, older established secondary school libraries may find some of the ASCIS database produces a low hit rate for their students needs.

One important need that is not being met in any systematic way is the exposure of students to the process of search and information retrieval systems operation (see ACER research programme, Appendix II D.1)

Representativeness

Generally, there is a slow but steady automation occuring on a small scale and as economic factors allow. The schools participating in the study were not typical in that three of the six are using ASCIC on-line and only one of the remaining three has no library automation.

Rationale

Reasons for Usage

- economical and speedy long-distance communication;

- information storage and retrieval;

- sharing of convenient networking (after hours exchange of curriculum, experiential learning of computer techniques, information uploaded when the telephone is available)

Reasons against usage:

- costs are either too great, or there is insufficient extra incentive to trade-off current limited funds for eventual savings in staff time;

- telephone unavailability;

- lack of knowledge or confidence;

- lack of support (or standardisation) in making the difficult decisions about what to buy or use.

In general the impression gained was that networking and information retrieval skills are highly valued and should be much more developed in schools. It was generally agreed by teacher/librarians (see Section 3.3.1), stakeholders and students (see Section 3.3.2), that networking is beneficial to students' understanding of the world and people (as in the Australaskan writing project, see Section 3.2.5). As well, it provides an effective distance education medium (see Q-NET, Section 3.2.6 and TELEMEMO projects, Sections 2.4 C and 3.3.2).

RECOMMENDATIONS

It is recommended that ALIC endorse the following recommendations (1-14) and refer them to appropriate agencies for implementation (for further information see appropriate Sections of Chapter 6).

A. GENERAL CONSIDERATIONS

Role of School Libraries

1. Steps must be taken at the Federal and State levels to increase recognition and support for the role of school libraries in the development of information retrieval and networking skills for students.

There are two main categories of issues requiring further attention in order to address the needs of school libraries in the fields of automation, information retrieval and networking.

2. Infrastructure Needs must be met with the provision of:

- dedicated micro-computers in school libraries;
- dedicated telephones in school libraries;
- standardisation of modems, and communication protocols to provide easier access to ASCIS and other on-line services and networks.

3. Organisational Needs must be met by the provision of:

- more thorough technical support for networking as part of the schools library or computer consultants services;
- teacher training and consciousness raising regarding the role of information technology and library automation in the development of information retrieval and usage and communication skills in pupils.

Standardisation

With the trend towards devolution of responsibilities to the schools and the regions, Education Departments of most states and territories have attempted to standardise by recommending a set of preferred products or suppliers for schools to follow up themselves.

One of the factors contributing to the success of ASCIS has been its high degree of standardisation from its onset. Issues which need clarification and a call for standardisation are:

4. Communication Protocols must be standardised.

5. Software Evaluation should be based on agreed criteria and bench-marks

6. Program Evaluation should be co-ordinated federally through relevant bodies such as ALIC and ACER so as to ensure comparability and validity throughout the educational system.

Further Research

It is clear that there is much which the present study could not investigate or for which it was not possible to develop valid conclusions. Areas for further analysis and investigation include:

7. Research is needed to thoroughly assess the market for information networking and retrieval systems in schools and its major segments.

8. Areas of technological development of potential usefulness to educational services need further examination to monitor the substantial developments; these include:

   - high density tape DAT (see Appendix II C.2)
   - CD-ROM (Phillips intend to release a cheaper Programmable CD-ROM in 1988, cf Appendices II C.1 and II C.3)
   - satellite/broadcast media (e.g. Q-Net, see Appendix II B.10.1)

9. Integration of library services with other school activities and operations should be encouraged at the Federal as well as state levels and must be made possible by fostering developments in information technology in Australia.

10. There should be National and local Search Conferences or Workshops on the developments and the needs of Electronic Information retrieval and networking in schools.

Experts (such as those mentioned throughout this report and in the references) could be invited to report and discuss their recent studies on the following topics:

Communication systems in Distance Education;
Mass storage systems;
Bibliographic and Library Automation systems;
Research on Education and Technology;
Education in Information Technology and Electronic Communication systems;
School Library Automation.

B. SERVICE or INDUSTRY SPECIFIC CONSIDERATIONS

ASCIS should be extended

This most important and cohesive innovation in the schools library field should be more widely promoted with every encouragement given to all schools to enter into the use of the facilities. Promotion may assist reduction of the costs of dial-up services.

11. Additional "value-added services" should be offered through ASCIS, e.g., "Guidelines"

The general interest in abstracts and user feedback about the relevance of material listed support the direction which ASCIS is heading with the integration of ACIN and the introduction of user dial-up and communication through ASCIS. One other "value-added service" which was well received by those consulted is "Guide-lines" (see Sections 3.3.1,6 and Appendix II D.5), a subject guide for periodicals. The speedy turn around available from electronic databases such as ASCIS, and the user networking capabilities would enhance the usefulness of this quite popular service.

12. Networking on ASCIS: Local Holdings Records

ASCIS should provide a holdings location code for each item to allow for local sharing of information for interlibrary loans (see Section 3.2.2).

Bulletin Board Systems

13. Independent BBS in schools should be fostered as long as they adopt a standard protocol (see Sections 3.1.1).

Commercial Sponsorships

14. Commercial sponsorship and donation of products should be monitored, but not discouraged to the detriment of the schools concerned.

1. INTRODUCTION

The study reported in this document was commissioned by the Australian Libraries and Information Council: **"to examine the extent to which government and non government schools have access to, and make use of formal and informal networks and information retrieval systems to supplement the information that is available to them from their own library services".**

The need for the study, and its urgency are underlined by the rapid expansion of information technology and its penetration into most aspects of life. In almost every form of media these days we are told of the benefits of new computer-based technology. Australia seems to be closely following overseas trends and moving ever more rapidly towards the "Telematic Society". This is a concept put forward by James Martin in 1978 to encompass the prospects of a community transacting its social and economic relationships via extensive use of integrated telecommunications and computing facilities.

In education the provision of cheaper telecommunications and computing facilities has allowed greater options for teachers to communicate with pupils, teachers and other professionals, at more convenient times and over great distances. However, Australia is significantly behind overseas developments in the use of computer information retrieval and networking systems in schools. This relativity is not just a matter of "Keeping up with the Joneses" or an Australian "Cultural Cringe" it is a real dilemma for the future of our ability to communicate and compete with the traditional innovators of information technology.

Overseas Developments

To give some perspective to the present study a few relevant reports from overseas have been sampled.

Ten years ago the American educational profession was told "There's a computer in your future". An article in American Education (November 1976) carried one of the first reports of computer assisted assessment and instruction. The 100 first grade children (in Palo Alto California) used main-frame computer terminals and light pens to learn reading and spelling by drill and practice.

Since then there have been many reports of the use of computers in schools in the USA including the development of, and communication by, school based information retreival and networking systems. An example of this trend in education is found in SpecialNet which was setup by the American National Association of State Directors of Special Education several years ago. Its pubicity material (see Supplementary Appendix II D.6.1 and D.6.2) claims it is the largest education oriented computer based communications network in the United States. SpecialNet provides a database of special education information for on-line retrieval and a national communication network providing electronic mail, and electronic bulletinboards. In addition to these traditional electronic network faciliities, SpecialNet offers information and advice on the latest curriculum and staff development methods as well as options for computer based survey data; collection, storage and analysis for educational research.

Similarly, in England educational organisations have taken advantage of the opportunities of computer based information retrieval and networking. For example, the Birmingham Education Authority (in conjunction with the Open University Student Computing Service) has since 1973 operated and developed a telecommunications network which provides computer facilities within the secondary school classroom and for administration of the educational services of the region. In 1978 micro-computers were introduced into this main-frame computer network with immediate benefits in the efficiency of teaching computer science and maths, and in the innovations of curriculum development options (Tinsley, 1980).

The advantages of a network of mini- and micro-computers for communications betweeen and within schools was also realised in Switzerland in the middle 1970's. Morel (1980) reported on the results of the work of the Swiss Informatics Co-ordination Group created by the Swiss Teachers in Secondary Education in 1975. By 1978 they had a service supporting about 1000 school users and a daily computer transaction rate of over 1000 compilations in more than six software languages from about 80 terminals.

The question of how well Australian schools are applying the new technology has been raised in many quarters and there have been disturbing indications that we are lagging behind other developed countries in our adoption of information retrieval systems. Madeline Juchau for example (Juchau, 1984), from her study of selected metropolitan high schools in New South Wales, drew the conclusions amongst others, that:

- "Most teachers appear to depend mainly on their colleagues for obtaining professional information...Awareness by teachers of the services available to them does not seem to be very high, and many teachers who report awareness of those services do not seem to use them."

- "....school libraries need to be more closely involved in the rapidly changing information scene, by working more closely with other types of libraries to provide better and wider services to their users...."

The current study was designed to give broad indications of the ways in which Australian schools are using information networks. It is not surprising that many issues were raised which could not be pursued in depth within the scope of the study. However, it has provided an important base for further exploration and insight into some of the current problems.

The findings of the study suggest that access to computers, data bases and information retrieval systems are limited by lack of resources money skills and facilities and time. But these limitations are not as constraining as the underdevelopment and insufficient use of local, needs based networking systems; even though large scale systems are available for schools.

2. METHODOLOGY

2.1 The Tasks

The project involved the following steps:

- Examination of the type, extent, and appropriateness of existing networks that are used by government and non-government schools.
- Evaluation of the perceived advantages and disadvantages or limitations of these systems and networks.
- Identification of ways to improve the use of and access to networks and information systems available or likely to be developed in the near future.

The scope of the study and the variety of interests to be considered meant that a consultative approach was an essential part of the method.

2.2 Two Phase Approach

There were two phases of the project, as follows:

Phase 1: Consultation with stakeholders to discover:

a. Availability:

What is the availability to schools of information retrieval networks?

b. Suitability:

How appropriate are these networks to the perceived needs of schools?

c. Representativeness:

What proportion of schools are using these networks?

d. Rationale:

Why are/are not schools using these networks?

Phase 2: Verification and Interpretation of Information Obtained in Phase 1 as follows:

a. informal survey of selected users and providers to explain, as far as possible, the information obtained in Phase 1.

b. identification of possible solutions and/or examine in detail the need for further research.

2.3 Implementation of the Method

After discussions with the Advisory group, details of the methodology to be used, the tasks involved and the time frame were agreed upon.

1. Identification of networks of school library services

It was not appropriate or expedient to approach the schools en masse or directly. The contact with schools was made through identifying the information service providers who have schools as their users, and through associations and agencies representing schools and library services.

Various means of soliciting information were used; telephone contact, written pro forma, electronic mail, Bulletin Board listing of the study, and broadcast through various information media likely to reach schools libraries and teachers.

2. Case Studies

This project was not an evaluation of various services mentioned in the present report, but rather a general overview of the appropriateness of these services and their capacity to meet the information needs of schools.

There have a been a number of recent studies (see Recommendation 10 on "Workshops") which have provided more detailed and comprehensive data than was possible in the time

and resources of the present study. Thus it was decided that the aim of the methodology used here would be to gain some perspective and update on these areas previously studied, or identify areas which need further study.

The focus of this task was on case-study of relevant information networks and services. These case-studies were chosen, to give a perspective across a range of services which government and non-government and primary and secondary schools are using. However, the main factor was the type of service provider. Methods of securing data were varied according to the type and level of the schools and networks found to be involved. In general the study encompassed:

- documentary analysis of promotional material, and other relevant material pertaining to networks, and information systems;

- discussions with individuals involved with the school usage of such services, e.g., teachers, principals, librarians and if possible, students;

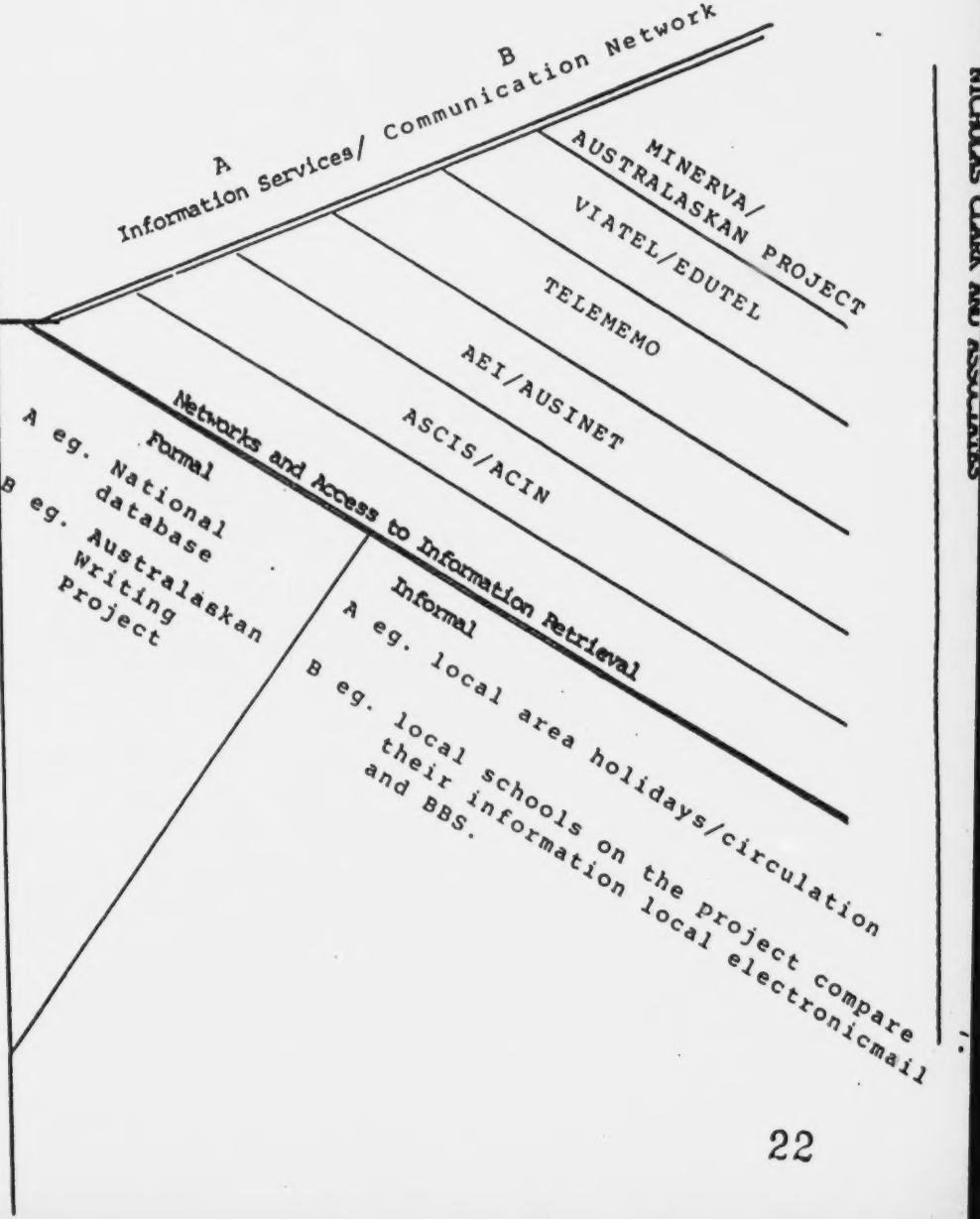
- discussions with representatives of service providers.

As can be seen from Figure 1 there are at least four dimensions or factors influencing the range of potential case studies: type of school, state, information service and type of network.

More intensive follow-up of four networks was conducted according to the type of information service provided. Details of these networks are summarised in Table 1.

Figure 1: Some factors which could be considered in the selection of Case Studies

	Government		Non-Government	
	Primary	Secondary	Primary	Secondary
STATES				
1. Victoria				
2. N.S.W.				
3. S.A.				
4. Tasmania				
5. Qland				
6. W.A.				
TERRITORIES				
1. A.C.T.				
2. N.T.				



NICHOLAS CLARK AND ASSOCIATES

TABLE 1

Name of Service	Type of Information service provided	Type of respondent interviewed
ASCIS	. Bibliographic	. Intensive & dial-up users: 1 small, 1 medium and 1 large scale user. . 2 non-intensive users (ie small scale card users)
Telememo	. Generic Electronic Mail	. Distance Education Project Coordinator . 2 students using Telememo for distance education
Tempest Templestowe Technical Teacher BBS	. Electronic BBS curriculum information	. Service providers . expert cum user
Teledata	. Generic electronic mail and and conferencing	. school service coordinator . school small user

Other services and technologies are commented upon where pertinent information was obtained in passing discussions with key informants. Appendix I gives details of who was interviewed.

2.4 Selection of Respondents of case studies

A. Respondents contacted through ASCIS

It was arranged with Georgina Cane of ASCIS for Allan Fergusson to contact some ASCIS users to invite them to participate in the study.

The selection of the interviewees to contact was aimed at access to as representative a list of users as possible within a small number. Therefore we contacted a small, medium and a large school from the 100 on-line users and a small and large school from the card users.

The teacher librarians at each school were read the following message:

"Currently a study is being conducted to examine the usage of information systems by schools, especially school libraries. The consultant for the study is Dr Colin Sharp of Nicholas Clark and associates, 428 St Kilda Road, Melbourne, 3004, who can be contacted on (03) 267 4777. He is very interested to talk with some users of ASCIS, about the current and future use of the on-line and catalogue card services.

He will want information on:

- which information services or networks your school uses?
- how appropriate or suitable such services are for the needs of the school, staff, students and libraries?
- what benefits are there for schools using these networks?
- what are the further unmet needs and future directions of school information retrieval and networking usage?

"Thank you for your help in this study."

Only four of the schools nominated were able to be contacted for the study, the three dial-up users and one small card user school. From these respondents, and others contacted independently of ASCIS, it was decided to identify the three dial-up ASCIS user schools as the main case studies and use another three schools which use cards as far less detailed comparisons. The following three were the dial-up user case studies:

1. A large dial-up user of ASCIS:

Beth McLaren
Librarian
Castle Hill High School
Castle Street, Castle Hill
N.S.W., 3154
phone (02) 634 1198

This relatively new, advantaged state school has 1400 students. The librarian has a qualified junior librarian, and 4 unqualified assistants sharing time (in effect 2.5 persons per week). In six weeks they turned over 3500 records from ASCIS.

This school library was one of the first ten dial-up users of ASCIS (NCIN) and currently also is using Ocelot on trial from ACI and Telememo through the Education Department of NSW.

They have 18 computers at the school:

- 1 IBM -XT (with hard disk) for school administrative work;

- Computer studies room with 15 Apple II's

In the library:

1 Sperry terminal
1 Apple with modem
2 IBM PCS for CCLLOT (cataloguing etc. from ASCIS files)

They have one library for the whole school - containing a large audio visual resources and 17,000 books. This was described as a moderately large collection.

Overall this is regarded as a fairly well resourced school with a fairly affluent upwardly mobile parent group. , About 1 in 4 of the families have computers at home.

2. A medium sized dial-up user of ASCIS

Shirley Campbell
Librarian
Radford College
College Street
Bruce, ACT, 2617
Phone (062) 513-663 or (062) 514-488

This new private secondary school started in 1984 with 235 students in years 7 and 8. It is growing at a rate which is estimated to yield a total school population of 800 (in years 7-12) by 1988.

They have a single library with 10,000 items and 5,000 on their own computerised catalogue.

They have 9 Apple IIe computers in the library with one hooked up to a modem used to dial-up ASCIS.

All students by year 9 have to do computer studies. They have a thriving computer club and about a third to a half of the families have a computer at home. However, it is not a very wealthy private school, in most families each parent has a job to support the children's education. Although it is rated as Category 6 for subsidy the school still does not have a gymnasium or a hall.

3. A small dial-up ASCIS user:

Elaine Chaffer
Librarian
"St Joseph the Worker"
79 Wilson Boulevard
Reservoir North
Melbourne Vic.
phone (03) 460-7506

This small Catholic primary school has 420 students. The two librarians share 0.5 of a position during which time they take 14 classes per week. They have 3 computers - one Apple IIe for general school classroom use (usually for grade 6) one Apple IIe for administrative and general use in the school, and one Apple IIe with BOOKTRACK and a printer for the library (which has been used for 2.5 years). They now have a 1200 band modem for dial-up to ASCIS and Micmarc with a bar code reader.

B. Respondents who represent the low usage of ASCIS (and/or hard only)

Of the three card using schools nominated by ASCIS only one school was able to participate in the study:

Ms Glenys Patulny
Teacher Librarian
Giralang Primary School
Canopus Crescent, Giralanng, ACT
phone: (062) 41-3511.

However, two other card using schools were able to participate:

Ms Jennifer Muir,
Teacher Librarian
Marybyrnong Primary School
Albega St. Kaleen, ACT
phone: (62) 41-3000

Mr Keith Darling
(editor of "Guidelines" see Appendix II D.5)
Chief Librarian
(Senior School Library)
Scotch College
491 Glenferrie Rd., Hawthorn Vic, 3122
phone: (03) 818-1261

C. Respondents contacted through Telememo

The project was discussed with Robin Bishop, the co-ordinator of the NSW distance education project using Telememo. She agreed to send a message to two students (one primary and one secondary level) who were regarded as sufficiently articulate to contribute to the study. It would not be appropriate for us to reproduce their names and addresses here.

It is sufficient to describe these respondents as follows:

Sally: Female aged 11 years, equivalent primary grade 6; nearest town -Tenterfield, NSW; IBM-PC user.

Rod: Male, aged 16, equivalent year 11; nearest town-Windsor NSW; uses Apple IIe computer.

3. FINDINGS

The main output of this study is the following description of the usage and perceptions of networks of information and library services accessed by schools, together with an appraisal of the general cost effectiveness of these networks at the service delivery level.

3.1 Regional Comparisons of Computer Networking in Schools

The following sections draw on the information largely obtained in phase 1 of the study: the consultation with key informants and stakeholders. The information provided mainly pertains to comparisons of the various states and territories in relation to their extent and implementation of information retrieval and networking systems for schools.

3.1.1 Database of Networks available to schools

NETCOMM The Australian computer MODEM and communications software manufacturers provide their users with a booklet including listings of 85 Australian and many overseas BBSs. This booklet is provided (not for copying) in the Appendix II B.1.1. Table 2 indicates the numbers of BBSs from each state included in this catalogue.

TABLE 2
NUMBERS OF BBS REPORTED BY NETCOMM

NSW	41
ACT	2
VIC	19
QLAND	10
SA	7
NT	3
WA	3
TOTAL	85

Table 3 includes a list of further BBSs available specifically for schools in Victoria.

It is convenient to examine such services in Victoria before taking a broad overview of the other states. However, the summary to follow cannot claim to be comprehensive, because in Victoria, as in other states, there are a number of new services being developed or existing services which are undergoing changes as yet undisclosed. In this current state of flux in Educational services around Australia such a study is likely to be quickly superseded.

TABLE 3
BULLETIN BOARD SYSTEMS AVAILABLE TO SCHOOLS IN VICTORIA

BBS	Phone	Contact	
Comet (logon):	03-211-0079	Peter McRobert Robert Aikenhead	) Caulfield High) School
The CAMOCO Project (Curriculum bank designed for children with disabilities) (logon) (voice) N.B.Membership fee of $120	 03-744-6088 03-744-5011	 Peter Tarr	 Sunbury Special School
School Ednet (currently on-line through Ministry of Education Library only- Not available for dial-up by school users.) It is planned to have a trial in February 1987) (voice)	03-628-2398	Rosemary Flora	School Library Services Minist of Education
Liblink (logon) (voice)	03-628 2415 03-628-2416	Margaret McLaren	School Library Services Minist of Education
Sci-net (logon) (voice	03-628-2185 03-628-2161	Dan O'Keefe Ian Reid	Science Centre Ministry of Education
Tempest (logon) (voice)	03-850-9328 03-850-6333	Juhani Touvinen John Widmer	Templestowe Technical School

Most of these BBS's use the standard communications specifications as follow (see details in Appendix II B.1.2):

Baud rate: 300/300 bits per second
Parity: no parity
Data bits: 8
stop bits: 1
Automatic carriage return

For further information on these and other BBSs contact:

Rosemary Flora or Margaret McLaren
Ministry of Education
Level 6, Rialto Tower
G.P.O. Box 4367
Melbourne, Victoria, 3001.
phone: 03-628-2398

or

Paul Birnell
State Education Computer Centre
Genoa St
Moorabbin, Victoria, 3189
phone: 555-8399

In addition the Victorian Ministry of Education is developing an Education Information Network (EDLIN); an on-line database of about 1000 items of curriculum material and Ministry of Education publications being offered through AUSINET. It contains a BBS software called "InformEd" (as do Scinet and Liblink) developed by Paul Birnell (State Education Computer Centre, Genoa St. Moorabbin, 3189 phone: 555-8399).

With the current re-structuring of the Ministry of Education, and funding cut backs some of the commentators were not sure which direction the school computer services and networking would eventually take. However, overall Victoria has some innovative and experimental information and networking systems available to schools, especially at the local or specialist level. Three are worthy of additional comment:

TEMPEST is an interesting BBS for Technical Teachers, providing information sharing and curriculum material in science and maths up and down loading.

The "CORPORATE REPORT" is a commercial information source provided by AAP Renters Press, which Chisholm Institute of Technology Library has made available to teachers and Senior students of Caulfield High School.

COMET is the experimental BBS for students and teachers run by Caulfield High.

All three show the interest and scope of local initiatives currently being developed, with limited resources, because of the involvement of teachers. They show a need for flexibility to encourage experimentation in telecommunication and information retrieval skills.

Other States

Victoria and NSW are somewhat atypical as the other states and territories have had a well established centralised computer network which their school libraries can access.

A.C.T.

All schools in the ACT subscribe to ASCIS at the subsidised rate, from the central organisations of the ACT Schools Authority, Catholic Education Office and Independent Schools Board. Although there are imminent plans for implementing an on-line system for schools to dialup ASCIS, at present in the ACT only 5 schools are doing this. There is close collaboration between the Catholic Education Office, Independent Schools Board and the ACT Schools authority in this venture. Several schools have invested in library automation software, but only a few are using BBSs.

Northern Territory

NCOM is the central network of all the government departments in the NT, which has a land connection to ASCIS in Melbourne. All high schools in the Territory are on-line to the NCOM and thus can access ASCIS centrally through NCOM and can use DOBIS/LIBIS. As yet the primary schools are not on-line, but they soon will be, once their Administrative network is connected in the next few months. Altogether there are 150 schools; about 85 have teacher librarians, most of the rest only have three or four teachers and no library at all. BookTrack (the Apple IIe software for cataloguing) is popular. However, the costs are high (about $4,500 to buy an Apple IIe, modem and printer) and the maintenance support is minimal. Most outlying schools rely on courier services because the telephones are still too unreliable to network. The Computer Education Centre and some high schools, have used MINERVA successfully to reduce telephone costs for interstate communication.

Queensland

There is a number of well established electronic mail and information services used by the state school system in Queensland. TELEMEMO is heavily subscribed for administrative as well as educational communications. QNIS like "Corporate Report" is a current affairs newspaper service (Queensland Newspaper Information Service) which has generated a great deal of interest in schools. Several schools have access to EDUTEL. However ASCIS is the most widely used information system with much interest from schools in the use of the dial-up facility.

Also of interest is Q-NET (see section 3.2.6 Appendix II B.10) an expensive, hi-tech satellite based computer and video link-up with remote pupils for distance education. This contrasts markedly with the TELEMEMO distance Education project in NSW (see chapter 2.4.6).

Western Australia

Currently, the Education Department provides a full cataloguing service. ASCIS has evolved in a complementary way in relation to the centralised mainframe-based system, but no schools are on-line to ASCIS. As with Victoria, the restructuring and changed funding circumstances of departments have caused commentators difficulty in predicting the eventual changes and emphases that will emerge in the

schools networking in the next few years. Again the Education Department has opted out of direct service provision for micro computers in schools, and taken the approach of investigating and recommending options for supply of equipment and software for schools to buy for themselves.

Tasmania

Similar to Western Australia and the Northern Territory, Tasmania also has a long established central network called TASNET. There are 35 high schools connected via a tie-line DEC (Digital Equipment Corporation) mainframe computer. There are also 150 schools using AUSPAC (Telecom STD toll-free packet switching network) via a modem to dial into the central network. From this network they can have access to ASCIS, AAP News database among others. Negotiations are underway for TASNET to have a direct connection to ACI for all schools to have access to ASCIS. However, there are some technical problems to be overcome first.

3.2 Comparisons of Major Information and Networking Systems

The following sections draw from the information obtained in phases 1 and 2 and are intended to summarise the main features which were mentioned by those interviewed. If further detail about the service is required it can be obtained by inquiry with the officers nominated, and by reference to the material provided in the set of supplementary Appendices (see ALIC Secretariat for Appendix II).

3.2.1 AEI (Australian Education Index)

This is an extensive database of published and unpublished educational research provided through AUSINET. ACER (the Australian Council for Educational Research) began this bibliography in 1956. It is published quarterly with an annual cumulative update. It has over 400 subscribers, not all of whom use the on-line facility (see Appendix II B.2.2). AEI now contains BETA (Bibliography of Education Theses in Australia) and databases from the National TAFE Clearinghouse in Adelaide.

The on-line service started in 1979, it costs $70 per hour on-line plus a $40 monthly service charge.

As a means of familiarising oneself with the service an on-line search was performed by Ms Elizabeth Oley (Head of Library and Information Service Unit at ACER) to seek literature pertaining to the present study (see Appendix II B.2.3). That Appendix shows the key words used in the search along with the numbers of references covered by that combination of descriptors.

3.2.2 ASCIS (Australian Schools Catalogue Information Service)

This non profit service organisation was commenced in 1984 to provide cataloguing services to Australian schools.

The heart of the service is the development and maintenance of a data base containing over 250,000 items which represent more than forty years of cataloguing effort.

The data base is being continuously updated with many thousands of new entries being made annually.

In 1986 ASCIS had over 5,000 schools which subscribed to the service. Most of these required the basic products: microfiche and catalogue cards. Also available is magnetic tape output and on-line service.

There were about 112 dial-up subscribers in 1986 using the on-line cataloguing, searching and circulation features of the system. Also available are a periodicals control and a public access feature.

Thirty subscribers in 1986 used the latest ASCIS service which provides catalogue information on machine readable floppy discs.

The cataloguing feature alone is highly cost effective for member schools. An estimated cost for cataloguing 5,000 items by hand is $20,000. Including membership and fees for service the ASCIS alternative can provide the same amount of cataloguing for $2,000.

ASCIS provides the opportunity for schools to reap the benefits of a coordinated, national cataloguing effort at minimal cost.

The ASCIS system is expanding rapidly and now includes such features as ACIN which provides abstracts or reviews which enrich the basic cataloguing information.

Respondents indicated that they saw the ASCIS services more as a tool for professional librarians than for teachers or students. There was potential for using the system to teach students how to search a data base. Another potential use suggested was that of providing a locational register for inter-library loans. Deficiencies with the system are that materials listed are not available locally and there is a lack of information about where items on the data base are held.

Some respondents made substantial use of ASCIS while others had been involved in the piloting of this or used it for only a short trial period. For some it was the only networking experience they have had.

It is found to be very useful for exemplary curriculum information, and one respondent stated that it is only used for difficult problems with regard to non-fiction.

It is found to reduce the work of librarians, especially in time saved in searching microfiche, while some saving in the cost of cards is observed.

Expert assistance in the use of ASCIS was found to be difficult to obtain and it was suggested that more resources be used in providing much needed support services. It was also suggested that if ASCIS provided a local record of available books it might help save money on book purchases.

There were, however, some criticisms of ASCIS:

- it is sometimes quicker to do one's own search and make one's own cards;
- it does not provide its own circulation system - another package is required for this purpose;
- the turnaround time for mainstream student books is too slow;
- log-on is too slow even at 1200/1200 rate - this is partly governed by the availability of a telephone line;
- it took over one week to get started on-line mainly because of the unavailability of expert help;

- there are some problems with the numbering system used:
  - there is insufficient sub-division within subject areas;
  - Dewey numbers and library call numbers do not always coincide.

3.2.3 AUSOM (Apple Users Society of Melbourne)

This is a large and thriving club of Apple computer users, including those who use the ubiquitous Apple II family or Apple II workalikes, and Macintoshes. As Apple IIe is still the most widely used computer in schools in Australia it is no surprise that AUSOM has a Special Interest Group of teachers (see Appendix II B.5.1). However, this S.I.G. is surprisingly new; it started in July 1986. One of its foci will be BBS and communication systems and modems. At the first meeting it was revealed that 20 of those present had access to a modem for their Apples.

3.2.4 The Corporate Report

This is a 24 hour news and information service delivered by microwave transmitters. Australian Associated Press (AAP) have marketed their Corporate Report to the commercial and government sectors and do not intend to make any concessions on cost for schools. However, Chisholm Institute has acquired the service for its Business faculty, and the Library has allowed the nearby Caulfield High School to have access to it. Corporate Report was well received at the school for its interesting flow of current affairs, media and stock exchange information. Obviously the relatively high costs and exclusive installation arrangements could prove a problem for its use in schools.

3.2.5 OTC (Overseas Telecommunications Commission)

AUSTRALASKAN WRITING PROJECT

This very interesting and successful social studies project has been conducted over three years and is continuing to grow in membership. It is meant to encourage electronic mail penpals among Australian and Alaskan children via the OTC Minerva. For the full explanation of the project see Appendix II B.8.2.4.

Service Provider:
Mr Bob Murray
OTC Project Co-ordinator
Australaskan Writing Project
OTC Australia, G.P.O. Box 7000
Sydney, 2001
phone: 02-230-5763.

Director Australaskan Writing Project
Mr Malcolm Beazley (Head of English Department)
Turramurra High School
Maxwell St. Turramurra
NSW 2074
phone: 02- 44 4654

The Australaskan Writing Project is an electronic mail exchange program linking students in Australia and Alaska using OTC's international telecommunications services. Initiated by Mr Malcolm Beazley, Head of the English Department at Turramurra High School in Sydney.

The Project aims to:

- provide a realistic context in which students can improve their written communication skills;
- provide an opportunity for cultural exchange- through writing and other language arts' activities- with a view to developing a greater understanding among people irrespective of race or creed;
- motivate linguistically less able students;
- provide an opportunity for students to develop their keyboarding skills;
- familiarise students with the use of international telecommunications.

When the project first began in 1983. Alaska was the destination country because of the interesting lifestyle of its inhabitants and the remote location of many of its villages. The choice has fired the imagination of our school children, and many schools throughout Australia have joined the project since its inception.

Schools participating in the Project require at least one micro-computer equipped with a single disk drive, a printer, a communications card for the computer and a direct modem linking the computer to the outside world.

The electronic mail destined for Alaska is word-processed by the students using the computer keyboard, then sent via OTC's MINERVA service to the designated destination school in Alaska.

All the participating schools are required to operate within a common context to ensure that the long term educational value of the Project is maintained. The activities at each school follow a structured program consisting of six stages:

- a brief initial contact with their "computer pals" in Alaska;
- the Report Writing stage allows students to cover a wider variety of topics such as food., hobbies, sports, music and other areas of general cultural interest;
- the poetry Writing stage is designed to foster creativity through exchanges of a different kind;
- the electronic journalism stage focusses on the writing of newspaper articles for a monthly class newspaper.

The students in Alaska use the articles they receive for a class newspaper called 'The Australian Times', while students in Australia publish an equivalent version, 'The Alaskan Times':

- social issues: interchange of ideas and information through written dialogue on major world and local issues such as the killing of whales, nuclear power, hunger and famine, Aboriginal rights and youth vision of peace;
- a final script writing stage encourages students to write scripts on the myths and legends peculiar to their particular culture.

There was a high degree of familiarity with this project among respondents and it was being used in the school of one interviewee. It is thought to provide excellent hands-on computing experience for students.

Network User:

Maribyrnong Primary School
Alberga St. Kaleen, ACT,
phone: 062-41 300
Contacts: Mr Bruce Neale,
Leader of the correspondence project;
Ms Jennifer Muir, Teacher-Librarian

The teachers reported that this project was very stimulating to the children even before they logged onto OTC to communicate with their nominated (matched) school in Alaska. It gave a very concrete vehicle for studying both the social and geographical environment of both the foreign land and the home territory. The teachers encouraged the latter because the children would have to know what to say to answer their peers in the other country. This stimulated the students to research from their local community library about the history and characteristics of their home environment.

There were some frustrations setting up the equipment, getting the membership number and password to OTC, loosing their first allocated Alaskan school due to delays at the Australian end, and running out of school year before they were able to get into the project. However, the whole experience was very positively received by the children and it fostered a better understanding of not just computers and networking, but also social studies and geography.

3.2.6 Satellite communications: Q-NET

Q-NET is an experimental distance education program bringing educational services to eight year 6 students in remote areas of Queensland via satellite (see Appendix II B.10.1).

The two major innovations of the trial are: the use of satellite technology and computers for distance teaching and the localisation of the program which is based in Mt Isa at the School of the Air (SOTA) rather than at the correspondence school in Brisbane.

The features of the system are: enhanced voice links of telephone quality between teacher and students; an electronic "blackboard", in the form of an Apple IIe computer, for data transfer; and, regular live video programs. All reception is via satellite - AUSSAT.

The system operates for about one and a half hours per day with students spending about four hours in addition working on printed course work.

The children spend half an hour in group learning activities such as shared problem solving tasks, debating, and enriching the program of printed course work and packaged materials.

Another half hour of teacher-directed sessions concentrates on the individual and involves one-to-one tutoring in areas needing revision or clarification. It is during these sessions that the communications applications of the computer, including the use of graphics, are being trialled.

The remaining half hour session each day is used for two-way data transfer and teacher/home/home/tutor conferencing.

The costs of installation are currently $50,000 per site and these are being underwritten by AUSSAT in the experimental stage.

The Q-NET system is applicable to remote areas where Telememo or other land based systems are not possible. It is experimental at this stage but it provides a highly interactive, state-of-the-art system of voice, word-processing, graphics and video features.

The project officer, Lloyd Lacey (Education Department, Queensland) is interested in the action research issues involved, such as studying the adaptation of the users and their families to this new found contact with the outside world. Especially interesting are the possible effects of the change in roles for the mother from teacher and companion to the more traditional parent observer role. He pointed out that the uniqueness of this opportunity in some senses outweighs the expense.

3.2.7 TELEDATA

TELEDATA (formerly The Australian Beginning, Camberwell, Vic), is one of the few national, small business information exchange systems.

On TELEDATA an Educational Bulletin Board has been set up for schools by the CATHOLIC EDUCATION OFFICE, P. O. Box 322 Warragul, Vic., 3820, (056) 231 720.

(See Appendix II B.11.3 for a print out of an on-line session, including list of user names of the Catholic and Government schools which participated in its conferencing and networking facility).

3.2.8 VIATEL- Telecom's national Videotex service (see Appendix II B.14).

Telecom's VIATEL has a Bulletin Board called "EDUTEL" (contact Ed Brumby, Head of Media Victoria College at Burwood). Some educational institutions (e.g. Gordon Institute of TAFE, Geelong) are providing access to this network for their students.

3.3 Other Findings of Phase 2 : In-depth Interviews

3.3.1 Teacher/Librarians

The following section summarises the comments of the teachers and library network users interviewed using the telephone questionnaire (see Appendix II A.1). These teachers/librarians were all selected on the basis of their use of ASCIS.

The first few questions (see reference to question number in brackets) give some information about the knowledge and involvement of the respondents before asking them their opinion of the services. These comments should be taken in the context of the resource and usage profile of the schools (see above Section 2.4).

Knowledge about using computers for information retrieval or networking (Question 1)

Two of the six interviewees said they knew little about use of computers for information networking. The others said they knew something about it. Their comments in explanation varied. They were:

One had some experience in working on a pilot for ASCIS. Another had used the Appleworks/database for listing of overdues and to run off bibliographies on an Apple II computer using Book-Track.

One respondent had started on the Australalaskan Writing Project.

For all respondents their ASCIS involvement represented their major way of gaining knowledge about using computers for information retrieval and networking, and their method of training was basically "learning by doing".

Extent involved with school libraries (Question 3)

Only three of the sample were very frequently involved with libraries (i.e. teacher librarians) and one said not at all involved.

Extent involved frequently (Question 5)

Only one respondent was involved frequently with computer based networking and information retrieval systems for education purposes. Four others were involved little or sometimes and one was not involved at all.

All those involved with use of computers for educational purposes were in the context of library use only.

Overall we can say our small sample had limited experience of all aspects of computing and computer networking.

Indeed, only one respondent had used other electronic mail or database services through a University. None of the others had any other experience apart from their own limited school use.

Opinions on Networks

All respondents said that the Networks had some usefulness for informative material and two of the six found them very useful. Only one however, reported that the Network information was very appropriate to school educational purposes; others felt that it had little or no appropriateness.

Networks were seen as being much quicker than other methods of gaining information and were useful in cutting down typing and auxiliary helper time. They assist the librarian in making purchasing decisions but the cost of using them (specifically the phone costs) are too great; particularly for a small user.

Appropriateness for cataloguing library information

Two respondents said that the data base was very appropriate (i.e. ACIN) for cards and microfiche. One said it had some appropriateness.

Other value - added services such as "Guide-lines" (see Appendix II D.5) are useful for students and teachers of their current validity in the social studies areas and for general knowledge. Guidelines provides one of the few catalogues of popular current periodicals and news reports.

The ACIN service could be better if it were computerised at a central location rather than local.

Standard of material available on computer networks in comparison with other types of information services

Two respondents commented on the ease of access of computer network material compared with other types of information services. Two felt that the quality of content on networks was better because it was more up to date and one commented that the information was more accurate.

Certainly, users find the network access far superior to microfiche. The quality of presentation is also superior even though the screen is small.

One problem mentioned is that of determining which is the main entry.

Interest of Material for Students

The teacher /librarians reported that the networks are not really used by students. Even in libraries that have their own separate telephone lines (and these are rare) only one student at a time can use the network. It is more important for students to know their own libraries than to have access to and knowledge of the ASCIS catalogue.

In spite of minimal opportunity to use the system students do show interest when the facility is demonstrated (for example in computer classes). In order to give students better access there are numerous conditions that need to be met:

. a dedicated line is needed to ensure timely access;

- a better data base and retrieval system is needed to ensure immediate access to accurate bibliographic data;

- automation is essential: the cards are cumbersome and slow;

- more finance is needed to provide for multi-user access and to help with ongoing costs (phone, cards, diskettes, etc.) but not with hardware;

- greater teacher awareness is required so that students can be stimulated by more adventurous and concrete programming;

- libraries need to be linked up to share resources: regionalisation of the network services could prove to be more cost effective. Linking and regionalisation should be imposed by the Ministry of Education because some schools do not wish to share resources;

- there needs to be a higher priority placed on use of networks, both within individual schools and by the Ministry of Education. The school library is the most appropriate provider of information about networks but the area is often introduced to students through computer classes.

Students who are most interested in using networks tend to be the more bookish, brighter students who are interested in computers in general. They have home computers of their own or in the family and tend to belong to computer clubs.

Courses which have most need for computer usage are language, social studies and mathematics. The greatest benefit to students and staff of linking into the network is the opportunity to find out what others are doing.

Networking is able to maximise the scarce time of school librarians enabling them to serve their teacher and student clients better and faster.

Involvement with alternatives to print

The teacher/librarians interviewed were not involved with any other audio or video information services. These were thought to be too expensive for schools because they needed specialised equipment such as interactive video disk.

Microfiche is very economical compared to on-line applications which are costly, too bulky to take home and limited to one user at a time.

3.3.2 Responses of Students

The students interviewed were using IBM PC and Apple IIe equipment. They had both obtained some knowledge of computers from reading books, studying the information that comes with the hardware and from hands-on experience. They both had some knowledge of networking and electronic mail from the list of selections available when ringing on as well as from printed instructions and practical experience. The secondary student claimed a great deal of knowledge in this area.

Both students said that it was very easy to log-on and use the Telememo system.

One student very frequently used the local library and sometimes the school library. The other had less involvement with libraries.

Both had frequent or very frequent involvement with computer based networking for educational purposes. The main messages were to school about school work and teacher replies. Students transmit answers to teachers who send back corrected assignments and new assignments. The secondary student had used only Telememo whereas the primary pupil had been part of pilot studies on Viatel and Minerva as well as Telememo.

Both students found the networks highly useful in gaining information. They particularly liked: the speed with which their questions could be answered; and the fact that they got a printed version immediately. The system combines the best features of mail and telephone: the student receives a permanent printed answer but it comes immediately. Their school work is often corrected the same day with this system.

In addition, both students commented favourably on the usefulness of the system for networking with other students but this was clearly a minor feature. Their main concern was to receive immediate response on their school work.

The system is very appropriate to the educational needs of these students because it enables them to contact their teachers every day and to receive immediate responses and rapid correction of their

work. It has the added advantage of familiarising them with computers.

The primary student said that she had a moderate interest in computers, while for the secondary student interest was very high. He often reads computer related books and magazines and is considering a career in computing.

Neither of the students had access to a computer before the distance education pilot study. Neither student had been given special help to enable them to use networks for their studies. The computer was primarily a means of better communication with their teachers but in the case of the secondary student this communication role had expanded to the point where all English lessons were being done on the computer with great success.

The students enjoy using the computer but are frustrated when breakdowns and delays occur.

3.4 Summary of Comments on Computer Software Packages Available to Schools

Several computer software packages were mentioned by the teachers/librarians interviewed. Some of these programs had actually been used by respondents while others were only familiar by name or hearsay. Obviously, this summary is by no means a complete catalogue of the many packages available in Australia. For further information one is referred to the publications by Clyde (1986 a and b) and the AEI.

The software mentioned by the respondents was as follows:

BOOKTRACK

This was the most commonly mentioned package for libraries. Although it is seen as having limited capabilities, it is considered to be a cheap and useful system for ordering purposes, for the production of cards, and for cataloguing mainstream books for students. It has reduced some of the repetitive work of the librarian. Most teacher librarians consulted found some advantage in showing the basic search procedures to students, and some school librarians allow students to

use the program. However, one respondent commented that students still have to rely on the catalogue because of the limited availability of Apple IIe computers in school libraries. This restricts the time each user may have to access the program.

MICMARC

This has been used by one respondent on a Sperry IT system for on-line search. It was considered to be better than either ASCIS or BOOKTRACK by one of the respondent librarians whose school had the finances available to purchase it. It was suggested that such student terminals will require upgrading to enable easier student access.

OCELOT

This is a LAN (local area network) supported on an IBM-PC with a hard disk, in one of the libraries contacted. The system was on trial through ACI. It was said to be useful for cataloguing and circulation purposes and the respondent considered it to be quicker to search than ASCIS.

4. DISCUSSION

4.1 Representativeness

Some commentators have expressed concern about the limitations of the present sample and the complexity of the field. In particular some of the Western Australian respondents had reservations about how adequately their situation would be represented in such a broad brush interview based investigation. Indeed the study is limited by various factors and the findings should be cautiously interpreted in view of the degree of diversity of services, and the difficulty of contacting representatives from W.A. and Queensland by telephone during daylight savings time of the eastern and central states. Of course, States and departments have their rights to pursue their own approaches as their needs dictate.

Recent surveys of the literature (see Clyde, 1986 a and b; Juchau, 1984; and Appendix II B.2.3) indicate an extensive range of articles and books on the subject of computer and information retrieval in schools. One such review found over 700 books and reports by December 1985 (Clyde, 1986b) another found over 400 software packages for school libraries on the world market (Clyde, 1986a).

There are so many factors which make it difficult to estimate the representativeness of the schools, and the teacher librarians associated with them, who participated in this review. Table 4 shows some of the information obtained about the extent of the on-line network users. It must be stressed that the information on extent and costs (columns 2 and 3) is highly deceptive because of the difficulty of obtaining accurate information, and to the different parameters involved in the costing.

TABLE 4

INDICATIVE CHARACTERISTICS OF MAIN NATIONAL NETWORKS

(N.B. This is only an indicative summary of data and comments from Chapter 3, further detail is available from the supplementary Appendices. The information is not for authoratative reference)

(1) NETWORK SERVICE (Provider and/or organiser)	(2) TOTAL NUMBER OF SUBSCRIBERS (estimated for November 1986)	(3) DIAL UP EDUCATIONAL USER GROUP MEMBERS (estimated school users as of Nov.1986)	(4) COST (does not include charges charges for dialling through STD or Auspac)	(5) WHY DO SOME SCHOOLS USE THIS SERVICE?	(6) WHY MIGHT SOME SCHOOLS NOT USE THIS SERVICE? (those with computers and modems - apart from the lack of direct telephone line)
ASCIS Georgina Cane (ph. 663 2866) (host is AUSINET) Ian McCallum (ph. 541 5600)	5,000+ (for hard copy service)	112	$11.50c per connect hour	. large database . quick for subject search . catalogue cards . machine readable services . ACIN and value added services	. cost of dialup . problems of log-on procedure
MINERVA (O.T.C.) Bob Murray (02) 230.5763	1,800	200+	$15 (AUSTPAC) $25 (International) (storage charges 40c per month per unit of 2048 characters	. Chat . BBS . Australasian Writing Project Malcolm Beazley (02) 44 4654 . ILL	. Expense
AEI Liz Oley (ph. 819 1400) (host is AUSINET) Ian McCallum (ph. 541 5600)	400+ (for hard copy services)	relatively few	$70.00 per connect hour + $40.00 per month (maintenance fee)	. large database . research capacity . freetext search . Boolean search	. perceived as too academic . pitched more at secondary and Tertiary Education . cost of on-line search . STAIRS system somewhat difficult to use
TELEMMO (host is TELECOM) Robin Bishop (02) 339 8436 Vic Carboon (Educational Consultant (03) 606-5738 (Educational Advisor Dr. Peter White (03 478.3122 x 2517)	Many Corporate users and overall, several thousands of individual users	. 420 trial users in N.S.W. . Corporate Educational box providers include: - Education Dept. of NSW, SA Queensland and Victoria - Association of Independent schools - Catholic Schools in ACT Overall school users could be 2,000+	Corporate: $200 joining fee, min. charge $300 per month, (after 3 months) min. 15 cents/minute connect storage fee = 0.5cents per 1000 characters. Single user rates are available (see Chapter 3 and Appendix II B.12)	. Distance Ed. Project in N.S.W. . Closed user group . minimal cost to users through education dept. corporate . membership flexible box control procedures . BBS	. only offers networking . no 'chat' mode . expensive for sole individual users
TELEDATA (ceased operation 5/12/86 after 4 yrs.)	1,600	120 members of Educational user group	$7.00 - 10% discount Educational user group ($2 monthly Newsletter in the maintenance fee $5 per month	. 10% discount . Educational BBS (closed user group) . Conferencial "Chat" Services . Information	. Service had 3 or 4 unpredictable extended downtimes
TELECOM (VIATEL) EDUTEL Australian Caption Centre (02) 212 5277 (Paul Budde Communications as of December 1986)	20,000+ 120 - 500		varies as charged by the cost of the screen per minute + membership of $3.50 per month	. games for students . chat for students . BBS for students . Access to information services . like a textual CB radio	. Slow speed increases connect cost . Cost of maintenance fee . little use for educational services . difficulty of control of student user costs through schools.

NOTE: Most of the figures quoted in this table are approximate estimates for the following reasons:

(a) the electronic mail services allow corporate users to sublet or pass on mail boxes to multiple single users at their own direction and at little or no charge, therefore the system would have difficulty recording the number of single users;

(b) the definition of an educational user is problematic because of the levels of involvement in education: primary secondary and tertiary, students and teachers. As the present study is concerned only with primary and secondary schools it is difficulty to separate out the relevant users.

(c) competition among electronic information service providers for the Education market seems to have reduced the availability of detailed information on actual users.

4.2 Comments on Specific Networks

As indicated in the note attached, the information in Table 4 must be interpreted with caution with regard to issues of representativeness and extent of service usage, because of the vagaries of reporting of numbers of users. The following comments are made to assist in the interpretation of these data.

4.2.1 ASCIS

Although recently (December 1986) the number of dial-up users has increased from 112 to over 200, basically the on-line ASCIS users are not typical of the wide range of school libraries, which are more likely to be represented by the card and microfiche users.

4.2.2 AEI

The comments about the target market of AEI indicate that there are relatively few on-line users of AEI among the schools. This is because of the cost and the level of emphasis on research literature. However, on-line AEI usage rate is difficult to estimate because of the ready dial-up availability through the public access facility of AUSINET. Any of the thousands of users of ACI services could dial up once for interest, or they could be research students working through a University library with extensive usage. Another complication is that many of the over 400 hard copy subscribers are centralised information sources for multiple users.

In order to obtain more accurate information it would be necessary to conduct an ongoing monitoring of user dial-up access over months of operation of AEI, and follow up a sample of these users to verify their status and rate of access to AEI.

4.2.3 MINERVA and TELEMEMO

It is estimated that there are a total of 1800 subscribes who used this system and approximately one tenth of these are educational users, mostly independent schools. It is thought that there are few state school users.

However, following consultation between the Australian National Library, OTC, Telecom, AACOBS and other interested parties, an arrangement is being made for the use of MINERVA as the preferred

medium for interlibrary loan messaging (see Appendix II B 8.1.2). This significant development in the consolidation and standardisation of networking services will have an impact on school libraries beyond the facilitation of ILL messaging.

An illustration of the potential spin-offs which might flow from such improved co-ordination of networking, can be seen with the introduction of electronic mail for administrative purposes in the school system. The introduction of TELEMEMO in various state school systems had a generalised benefit in terms of the communication of travelling computer consultants remote from their office and colleagues. Through the electronic mail network they were using for schools administration during the day, they were able to communicate and check their mail by night from their billeted rooms.

4.2.4 EDUTEL

As from mid-December 1986 the EDUTEL provider is Paul Budde Communications. The Australian 'Caption Centre' is no longer able to justify subsidised access to EDUTEL because of the low usage of the service on a national basis by educational users. The anticipated use of the service by educational users, based on studies of a similar service in the United Kingdom, did not materialise and has led to the change in service provider.

5. CONCLUSIONS

5.1 Funding

It is obvious that this study was conducted at an important time in the development of computer networking and information retrieval in schools, coinciding with the cessation of the Schools Commission funding for the computer education and staff development programmes (see Appendix II D.4). A number of interviewees commented on the possible deleterious effects that would ensue because of the discontinuation of the funding. Especially important is the impact this will have in two areas:

- Teacher training and staff development:

  - There is still a great need for teachers to catch up and keep up with developments which will influence the framework of education: such as the extensive use of computer networking. It is evident that Australia has still a long way to catch up with the USA in the quantity (if not the quality) of teacher networking and hands-on experience in use of computers (see also Section 5.6).

- Computer networking:

  - Schools in the more remote areas of Australia are particularly vulnerable to escalating isolation from their peers in the cities. Although, the satellite systems will soon come to the fore (see Appendix II B.10.1), teachers and students in these remote areas may feel the frustration of insufficient or unsatisfactory computer networking because of the raising of expectations that the satellite will bring. This will expose the schools to further deficiencies of funding in attempting to cope with escalating expense.

EXPENSE

A number of contributors (from both the public and the private school systems) referred to the costs of the computer networks and information retrieval systems as the main factor limiting their usefulness to schools (see: Walter, 1986).

5.2 Availability

There are at least four national networks currently operating which are available even in some of the remote High Schools of NT and northern NSW: (see Table 4, Section 4.2).

- AUSINET which also provides the databases, ASCIS and AEI;
- MINERVA which has been used by schools in NT and Tasmania;
- TELEMEMO which provides the preferred network for NSW distance education unit (420 students on-line);
- VIATEL with the closed user group EDUTEL which is readily accessible with little computer equipment (however, it does not have a large number of users).

Despite these services being on the market, availability to schools is limited by the following factors:

- availability of telephones for school libraries is very restricted: even if a phone is connected it is often not available for the on-line dial-up during school hours because of the demand for other uses;
- availability of teacher time as most teacher/librarians seem to be only employed less than half-time;
- costs are the main deterent of school use even for ASCIS which is highly subsidised.

5.3 Suitability

There is no question that electronic mail services (eg. Telememo) are suitable and appropriate for distance education (see Chapter 3).

ASCIS and the value-added services like ACIN are relevant and well appreciated by all consulted. However, there are some occasional miss-matches with particular needs. For example, older established secondary school libraries (eg. Scotch College) may find some of the ASCIS database produces a low hit rate for their students' needs.

One important need that is not being met in any systematic way is the exposure of students to the process of search and information retrieval systems operation (see ACER research programme, Appendix II D.1).

5.4 Representativeness

Generally, there is a slow but steady automation occurring on a small scale and as economic factors allow. The schools participating in the study were not typical in that three of the six are using ASCIC on-line and only one of the remaining three has no library automation.

Teacher/librarians were our main informants for phase 2 of the present study. It can be argued that their response to and use of information networks would be very different from the mainstream of teachers. However, it appears that there are still relatively few teacher/librarians who are using electronic sources or information retrieval and networking. As information systems are the stock-in-trade of teacher/librarians one would have expected them to be well informed and more actively pursuing the electronic systems than other teachers. In general the impression obtained from the present study supports the findings of the survey by Juchau (1984). She pointed out that teachers tend to use oral and informal (e.g., staff newsletters) or promotional (e.g. commercial product release) written communication, rather than electronic literature search as their main sources of information.

5.5 Rationale

Several reasons for usage were emphasised in discussions with the participants, as follows:

5.5.1 Reasons for Usage

- economical and speedy long-distance communication;
- information storage and retrieval;

- sharing of convenient networking (after-hours exchange of curriculum, experiential learning of computer techniques, information uploaded when the telephone is available)

5.5.2 Reasons Against Usage

- costs are either too great, or there is insufficient extra incentive to trade-off current limited funds for eventual savings in staff time;
- telephone unavailability;
- lack of knowledge or confidence;
- lack of support (or standardisation) in making the difficult decisions about what to buy or use.

5.6 Teacher Training

The great majority of the informants in the present study pointed out the necessity of teacher education regarding the use of new technologies for communication, networking, information storage and retrieval.

Apparently most states and territories have regional computer consultants, and regional or state library supervisors. However, there does not seem to be satisfactory linkage between the two groups with regard to support for teacher librarians seeking assistance with computer information retrieval services. This limitation of support, plus the limitations of: access to the telephone; and computing and financial resources required to utilise the services satisfactorily are a great discouragement to teacher/librarians. The secondment of a specific Liaison Officer for each system (e.g. as for ASCIS in Queensland) would provide a valuable boost to the teacher training and the efficiency of access to these systems. This would complement the development of Educational Computing Centres in each state (see also UK, Tinsley, 1980).

In general the impression gained was that networking and information retrieval skills are highly valued and should be much more developed in schools. It was generally agreed by teacher/librarians (see

Section 3.3.1), stakeholders and students (see Section 3.3.2), that networking is beneficial to students' understanding of the world and people (as in the Australasian writing project, see Section 3.2.5). As well, it provides an effective distance education medium (see Q-NET, Section 3.2.6 and TELEMEMO projects, Sections 2.4 C and 3.3.2).

6. RECOMMENDATIONS

The results of the investigations have led to the following recommendations regarding current systems, suggested approaches and further directions for investigations that ALIC should consider regarding the future information needs of and likely developments for schools. These recommendations are directed to ALIC as the instigator of the research, but the nature of the recommendations requires that they be implemented by other bodies.

The recommendations are presented in two sections:

A. General Considerations which deal with the information retrieval and networking industry in general, and

B. Service or Industry Specific considerations which deal with further development of existing services.

A. GENERAL CONSIDERATIONS

6.1 Role of School Libraries

1. Steps must be taken at the Federal and State levels to increase recognition and support for the role of school libraries in the development of information retrieval and networking skills in children.

   Most school libraries contacted in the present study are struggling under the burden of escalating resource costs, resource requirements and the raising of expectations for services. There is a need to recognise the importance of the role of the school library and teacher/librarians in the provision of opportunities for school children to gain the necessary information retrieval skills which will be an essential part of the social and economic transactions of their future.

   There are two main categories of issues requiring further attention in order to address the needs of school libraries in the fields of automation, information retrieval and networking:

2. Infrastructure Needs must be met with the provision of:

- dedicated micro-computers in school libraries;
- dedicated telephones in school libraries;
- standardisation of modems, and communication protocols to provide easier access to ASCIS and other on-line services and networks.

3. Organisational Needs must be met by the provision of:

- more thorough technical support for networking as part of the schools library or computer consultants' services;
- teacher training and consciousness raising regarding the role of information technology and library automation in the development of information retrieval and usage and communication skills in pupils.

6.2 Standardisation

With the trend towards devolution of responsibilities to the schools and the regions, Education Departments of most states and territories have attempted to standardise by recommending a set of preferred products or suppliers for schools to follow up themselves.

One of the factors contributing to the success of ASCIS has been its high degree of standardisation from its onset. Issues which need clarification and a call for standardisation are:

4. Communication Protocols must be standardised

Currently the diversity of communications equipment, software, protocols, and teacher knowledge and experience are making it difficult and expensive for ACI to provide dial-up to ASCIS. ALIC could approach the CDC and the NACS to cooperate with ASCIS and ACER to recommend a standard for telecommunications and networking among schools.

5. Software Evaluation should be based on agreed criteria and bench-marks

As a result of their investigations Clyde and Scriven have called for some standardisation of bench-marks for software evaluation in the attempt to assist schools to cope with the plethora of information and options available for educational and libraries software. As a result of its recent consultative conference (see Appendix II D.1), ACER has this as one of its items to follow up for its research program development.

6. Program Evaluation should be co-ordinated federally through relevant bodies such as ALIC and ACER so as to ensure comparability and validity throughout the educational system

The growing number of innovative programs piloting the introduction of networking, raises concern about how the outcomes of these programs will be compared and evaluated. For example, there are similar intents and objectives for the Q-Net and Telememo projects although the approach and indicators used seem very different. If administrators and ministers are going to prioritise the allocation of scarce resources in the area, some agreed indicators and evaluation principles would be advisable. ALIC could approach the ministers concerned to recommend a national working party on standards and evaluation for schools networking. Again ACER is already looking into this with regard to evaluation of Education and Technology programs.

In particular, some agreed basis for cost-effectiveness evaluation based on comparison of on-line costs would assist education departments and schools to assess the overall costs of the services.

6.3 Further Research

There are several areas which the present study could not investigate or for which it was not possible to develop valid conclusions. Areas for further analysis and investigation include:

7. Research is needed to thoroughly assess the market for information networking and retrieval systems in schools and its major segments.

   This would entail a thorough literature search (the initial key word search for this has been started through AEI, see Appendix II 2.3), and analysis of the existing recent conference reports available from various agencies and libraries, supplemented by in-depth discussions with personnel from the various services and the school users. It may be possible to secure some quantitative data from the service providers and libraries. An overview analysis may be undertaken on the current users of non-print information media.

8. Areas of technological development of potential usefulness to educational services need further examination to monitor the substantial developments; these include:

   - high density tape DAT (see Appendix II C.2)
   - CD-ROM (Phillips intend to release a cheaper Programmable CD-ROM in 1988, cf Appendix II C.1 and C.3)
   - satellite/broadcast media (e.g. Q-Net, see Appendix II B.10.1)

9. Integration of library services with other school activities and operations should be encouraged at the Federal as well as state levels and must be made possible by fostering developments in information technology in Australia.

   In the area of database management, for example, there is potential to use similar systems for the management of other school information resources as well as for control of library collections. The costs and benefits of such integration require thorough assessment and appraisal.

10. There should be National and local Search Conferences or Workshops on the developments and the needs of Electronic Information retrieval and networking in schools.

The plethora of new developments in information retrieval systems, alternative telecommunication networks and media and their current or potential impact on schools is beyond the scope of any one study.

There are several other studies currently or recently investigating similar issues (some have been alluded to above). Some of these are as follows:

- Ed Brumby (Victoria College, Burwood) is conducting an evaluation of Edutel on Viatel, for a Masters degree in Education;
- Dr L. Ann Clyde (Head of Library Studies, Western Australia CAE) has conducted extensive critical searches of the software available for school libraries;
- Dr. Geoff Cumming (Psychology, La Trobe University) has conducted many studies of the use of computers in assisting language development in primary school children;
- Lloyd Lacey (Education Department Queensland) is conducting a major study on satellite communications, Q-Net in distance education (see Appendix II B.10);
- Prof. Michael Scriven (Education University of WA) is conducting an evaluation of the Australian Caption Centre Superdisk project (see Appendix II C.3.2);
- Dr. Barry McGaw (Chairman of the Working party of AEC) is working on ACIN and Education Technology;
- John Reid (Vic. Education Computer Centre) and Juhani Touvinen (Templestowe Technical School, Vic.) are conducting studies on school based BBSs;

. Peter Jeffries (Head of Consultant Services, ACER; Theme Coordinator of Education and Technology, ACER Research and Development Programme) is working on research trends in Education and Technology.

It is also necessary to regularly cover recent developments in library services and information technology, including:

- computer software for integration for accessions, cataloguing, circulation, and user consultation;

- video-disk, and compact disk mass storage media;

- local area networks (linking a number of computer units in the one building or office complex) to facilitate economies of scale, and flexibility of existing computer equipment.

- News services (e.g. "Corporate Report" from Consolidated Press) used by C.I.T. to allow students the latest information sources for current affairs, journalism studies, etc.

It would be desirable and possible that a number of the investigators or instigators of such inquiries be drawn together to share their findings and recommendations at a search conference. If required, a workshop format may be established, to bring together officers from different library and school sectors to discuss the formal and informal networks and information systems, the role of the school library service and the means by which improved and efficient services can be provided.

The ACER has already taken initiatives in research and in bringing together interested parties in a theme conference (see Appendix II 0.1). It might therefore be a logical organisation to set up a collaborative conference of the type envisaged here.

Alternatively a computer BBS conference could be conducted using a delphi technique (circulation of cumulative drafts of discussion documents). This could relatively easily be

established using TELEMEMO perhaps through the auspices of AOLIN (Australian Open Learning Information Network, see Appendix II B.12.1 & II B.12.2).

Experts (such as those mentioned throughout this report and in the references) could be invited to report and discuss their recent studies on the following topics:

Communication systems in Distance Education;
Mass storage systems;
Bibliographic and Library Automation systems;
Research on Education and Technology;
Education in Information Technology and Electronic Communication systems;
School Library Automation.

B. SERVICE or INDUSTRY SPECIFIC CONSIDERATIONS

6.4 ASCIS should be extended

This most important and cohesive innovation in the schools library field should be more widely promoted with every encouragement given to all schools to enter into the use of the facilities. Promotion may assist to reduce the costs of dial-up services.

11. Additional "value-added services" should be offered through ASCIS, e.g., "Guidelines"

The general interest in abstracts and user feedback about the relevance of material listed support the direction which ASCIS is heading with the integration of ACIN and the introduction of user dial-up and communication through ASCIS. One other "value-added service" which was well received by those consulted is "Guide-lines" (see Appendix II D.5), a subject guide for periodicals. The speedy turn around available from electronic databases such as ASCIS, and the user networking capabilities would enhance the usefulness of this quite popular service.

12. Networking on ASCIS: Local Holdings Records

A number of school librarians lamented the lack of local circulation information through ASCIS. According to the experts it is possible to provide a holdings location code for each item on ASCIS. Such a simple addition would enable local sharing of loans and perhaps acquisitions. The savings in terms of duplication of acquisitions, time of library and school personnel in wasted inquiries from frustrated students and unnecessary orders would be considerable.

6.5 Bulletin Board Systems

13. Independent BBS in schools should be fostered as long as they adopt a standard protocol.

The excellent efforts of the TEMPEST and COMET BBSs in Victoria should be seen as an inspiration to schools to network. Obviously the willy-nilly spread and excessive duplication of separate small BBSs is not to be encouraged, but neither should any strict centralised control be imposed. Market forces may be over-riden by the disparities in resources of schools.

6.6 Commercial Sponsorships

14. Commercial sponsorship and donation of products should be monitored, but not discouraged to the detriment of the schools concerned.

Due to the economic constraints of most schools there is little opportunity to buy more than one modem and software package. The staff at Templestowe Technical School were able to offer a system for loan of modems through TEMPEST by a sponsorship arrangement with a local modem supplier. This enabled new school users to try out the BBS under no obligation to buy before making their decisions about networking. Obviously commercial interests could realise that they are able to exploit a potential growth area of users in the school children who will be the future computer system buyers. For several

years Apple Computer Corporation and IBM have run a Tertiary Buy scheme and Educational discount arrangements for these reasons. Some federal body should be responsible for coordination of this type of arrangement.

7. GLOSSARY

8. REFERENCES

7. GLOSSARY

In order to assist those who are not familiar with some of the acronyms, abbreviations and terminology to be found in the information technology, library or computer fields, the following glossary is provided. Inevitably this list is incomplete. The references, and the Appendices at the end of this report are more comprehensive.

ABN - Australian Bibliographic Network.

ACIN - Australian Curriculum Information Network

A national computer database of selected exemplary curriculum references, currently provided as a value-added service on ASCIS (see Section 4.1.3).

ASCIS - Australian Schools Catalogue Information Service
The only national database of schools catalogue information shared among all states and territories (see Appendix II B.3).

ASLA - Australian School Library Associationn.

AUSINET - Australian commercial network and databases operated by ACI (see Appendix II B.4).

AUSMARC (Australian Machine Readable Codes) - standard code used by ASCIS for machine read file transfer.

BASIC - Beginners' All-Purpose Symbolic Instruction Code.

BAND RATE - The rate of electronic communication between computers and their peripheral input or output devices (measured in terms of bits of information per second).

BBS - Generic acronym for computerised Bulletin Board Systems (see Comer & Peterson, 1985; Martin, 1981; Appendix II B.1).

CCS - Generic acronym for computerised conferencing systems (see Comer & Peterson, 1985; Levinson, 1985; Appendix II B.1)

CD-ROM - Compact Disk- Read Only Memory (see Appendix II C.1)

DAT - Very high density and high fidelity Digital Audio Tape (see Appendix II C.2)

Databases and Database Management Systems (DBMS)

This is the computer software that enables management of information by structuring it in a specified form (see Rumble, 1984). DBMS are used to permit selection of information by choosing to search the store according to various previously labeled characteristics of the information. DBMS are sometimes called DBASES after one of the most popular software packages dBase II by Ashton-Tate.

DBMS are very useful in computer conferencing or with BBS (Page, 1984).

DOBIS/LIBIS (Dortmund Bibliographic Information System/Leuven Integrated Bibliographic System) - widely used IBM mainframe computer software which runs the ASCIS database (see ASCIS Newsletter, No. 1, Appendix II B.3.4.1)

ERIC - Educational Resources Information Center.

ILL - Interlibrary Loan.

Informatics - The curriculum subject recommended for secondary education at an OECD seminar on computing in education in 1970 (see Lyster, 1980). The topic encompasses all forms of information technology, such as telecommunications and computing; similar to Telematics (see Martin, 1981).

Interactive Video - Computer controlled video playback machine which can be video tape, but this is less effective than videodisk (see Cook, 1984; Hofmeister & Maggs, 1984; Appendix II C.4)

KWIC - Key-Word-In-Context.

KWOC - Key-Word-Out-of-Context.

LAA - Library Association of Australia.

LAN (Local Area Network) - This refers to a computer network usually involving a number of PCs linked within one local system or organisation. The main feature of a LAN is that individuals can use the separate PCs independently, or when required, link into of communication facilities of that wider system, such as electronic mail, and bulletin boards. Sometimes the LAN can be used for communicating other electronic information e.g., video (see Appendix II B.15)

LASIE - Library Automated Systems Information Exchange.

MARC - Marchine Readable Cataloguing.

Microcomputer (otherwise known as "personal computer" or PC) - A type of computer which generally has a capacity of under 1 mega byte of internal memory and is relatively low in cost compared to those with higher capacity. They provide opportunity for computing from entry-level to a full system for single independent users.

MINERVA - Electronic mail and communications facility from OTC (Overseas Telecommunications Commission) for computer links within and outside Australia (see section 4.1.8 and Appendix II B.8).

Modem - a contraction of MODulate-DEModuluate used to describe the equipment used to connect a computer to another computer over the telephone system. To make this connection it is necessary to MODulate a computer signal into a telephone (radio frequency) signal to transmit to another telephone connected to another computer which has to DEModulate that radio signal before the reciever can interpet it.

NLA - National Library of Australia, Canberra.

Network (otherwise known as a Library Network) - An association of autonomous libraries usually formalised, such as in the inter-library loan service (Horton's 1976 Committee distinguished this from an informal co-operative arrangement or service with some central functions).

Networking (otherwise known as computer networking) - (see Crawford, et al. 1982; Howell, 1986; Webster, 1980)

OCELOT - Micro-computer based library management system which is compatible with DOBIS/LIBIS used by ASCIS (runs on MS-DOS or PC-DOS for IBM-PCs or compatible micro-computers) developed by Alan Ball, and marketed by ACI (see ASCIS newsletters Appendix II B.3.4).

SLA - School Library Association.

STAIRS (Storage And Information Retrieval System) - the computer software run on the IBM mainframe computers by AUSINET to process the databases such as AEI.

Stakeholder - any individual or organisation who has a specific interest in the introduction, use or evaluation of networks and information retrieval systems in schools.

Supertext Superdisk - A videodisk with "supertext" captions developed by the Australian Caption Centre in conjunction with the Education Department of Western Australia (see section 4.2.3; Appendix II C.3.1).

TASCIS - Tasmanian Schools Cataloguing Information Service.

TASNET - Tasmanian Network.

Technology Assessment and Education - One definition of Technology currently being discussed is "artefacts and knowledge (implicit or explicit) in the service of artefact production" (see Scriven's 1985 Appendix II as used in the ACER Seminar on Education and Technology, November, 1986, see present report Appendix II D.1.2). Scriven proposed a new field of curriculum called "Technology Assessment" to include Ergonomics, design and social aspects of information technology.

Telematics - from the French "telematique" referring to the integration of telecommunications and computing, (see Martin, 1981) similar to INFORMATICS.

VALA - Victorian Association of Library Automation.

VIATEL/VIDEOTEX - VIATEL is Telecom's national Videotex service. Videotex provides a user friendly menu-driven colour screen based BBS and message medium through which service providers can charge users for information uploaded (e.g., advertising material) or viewed. It can be accessed through the normal voice telephone service from Telecom by a "dumb terminal" and displayed on a TV screen (see Section 4.1.14 and Appendix II B.14).

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APPENDIX I

SOURCES OF INFORMATION

APPENDIX I: SOURCES OF INFORMATION

Phase 1: Consultations with Stakeholders

Key interested persons and organisations were identified by consultation with some members of ALIC. Others consulted as the study progressed helpfully suggested additional sources of information which were gratefully received. These stakeholders were contacted and their names are noted below.

In the consultative process, it was necessary for advice and direction from persons and groups who have both interests in the outcome of the project, as well as perspectives that are vital to our understanding of the data received from other sources.

Those key individuals who were interviewed are referred to with regard to their state or federal address, as follows:

Federal

Ms Georgina Cane
Executive Director
Mr. Allan Fergusson, Education Officer
ASCIS
2nd Floor
449 Swanston St. Melbourne, 3000
Phone: (03) 663-2866

Mr Ian Mc Callum
National President
Library Association of Australia
310 Ferntree Gully Rd
Clayton, Vic, 3168
phone: (03) 541-5600

Ms Elizabeth Oley
Head Library and Information Services Unit
ACER
P.O. Box 210 Hawthorn, Vic. 3122
Phone: (03) 819 1400

Members of ALIC and ALIC Secretariat

Mr M. D.G. Coley
and Ms Jenny Gleeson
ALIC Secretariat
Department of Arts, Heritage and Environment
G.P.O. Box 1252
Canberra ACT 2601
Phone: (062) 46-7307

Mr Peter Cameron
Assistant Secretary
Department of Education
Canberra
Phone: (062) 89-3518

Ms Jane La Scala
Librarian
State Library Council
of Victoria
Melbourne
Phone: (03) 669-9961

Australian Capital Territory:

Mr Martin Hood, Computer Consultant,
Mr Michael Kelly, Director Finance & Admin.
Catholic Education Office
A.C.T.
Phone: (062) 95-5431

Mrs Brenda McConchie
Executive Officer
Library Services
ACT Schools Authority
P O Box 20 Civic Square
Canberra ACT 2608
Phone: (062) 954-321

New South Wales

Dr. Bruce Keepes
Computing Unit
Sydney Institute of Education
P.O. Box 63 Camperdown, NSW, 2050
phone: (03) 660-2855

Mr Colin McDonald
Assistant Director of Services
NSW Department of Education
P O Box 439
North Sydney NSW 2060
Phone: (02) 240-8442

Dr Ian Pirrie
Head Computer Education Unit
NSW Depatment of Education
P O Box 439
North Sydney NSW 2060
Phone: (02) 517-6900

Northern Territory

Mr Vic Czernezkyj
Principal Education Officer
Computer Education Centre
N.T.
Phone: (089) 85-0357

Ms Naida Tattersall
Assistant Director
School Library Services
P.O. Box 39971
Winellie, N. T. 5789
phone: (089) 85-0238

Queensland

Mr Robert Burnheim
Acting Director, Standards Section
Libraries & Resources Services Branch
Department of Education
P.O. Box 33
North Quay, Brisbane, Qld, 4000
phone: (07) 224-7937

Mr Lloyd Lacey
Director Technology Services
Department of Education
P.O. Box 33
North Quay, Brisbane, Qld, 4000
phone: (07) 224-7198

South Australia

Mr James Dwyer
(ASCIS Chairman)
Superintendent of Studies
Library Resource Development Unit
Education Department - South Australia
31 Flinders Street
Adelaide SA 5000
Phone: (08) 227-3209

Mrs Jill Stevens
Co-ordinator Third National Conference
on School Library Automation
Librarian
Heights School
Brunel Drive
Modbury SA 5092
Phone: (08) 263-6244

Tasmania

Mr Glen Pullen
Supervisor of Libraries
Library and Information Unit
Ministry of Education
71 Letitia St.
North Hobart, Tas, 7000
phone: (002) 30-7180

Victoria:

Mr Ed Brumby
Head of Teacher Services Section
Victoria College
221 Burwood Highway
Burwood Vic 3125
Phone: (03) 285-3352

Mr Murray Cropley
Education Information Network: ACIN
GPO Box 4367
Melbourne Vic 3001
Phone: (03) 628-2423

Ms Jennifer Goddard
Forum of Information Associations (Vic)
P O Box 532
Bendigo Vic 3550

Mr David Lutz
Teledata Communications Network
24 Camberwell Road
Hawthorn East Vic 3123

Dr Barry McGaw
Chairman of Working PArty on ACIN
Australian Education Council
and Dircetor ACER
P.O. Box 210 HAwthorn, Vic. 3122
Phone: (03) 819-1400

Mr Dan McKinlay
Computer Manager
Hawthorn Institute of Education
442 Auburn Road
Hawthorn Vic 3122

Ms Margaret McLaren & Ms Rosemary Flora
Ministry of Education
6th Level Rialto Towers
525 Collins Street
Melbourne Vic 3000
Phone: (03) 628-2416; 628-2398

Mr Michael Manning
Lecturer in Librarianship
Monash University
Clayton Vic
Phone: (03) 541-0811

Ms Faye Nicholson
Lecturer in Librarianship
Melbourne State College
Grattan St, Carlton, Vic. 3053
phone: (03) 341-8674

Mr Dan O'Keefe
Ministry of Education
Science Centre
Curriculum Branch
Ministry of Education
Phone: (03) 628-2161

Mr Sean O'Sullivan
Head of Computer Studies RMIT
Swanston St. Melbourne, 3000
phone: (03) 663-5611x273

Mr Don Schauder
Librarian
Chisholm Institute of Technology
P O Box 197
Caulfield Vic 3145
Phone: (03) 573-2157

Mr Neil Watkins
Computer Consultant
Catholic Education Office
P O Box 322
Warragul Vic 3820

Dr. Peter B. White
Education Department
La Trobe University
Plenty Road
Bundoora, Vic 3083
Phone: (03) 478-3122
Ext. 2517

Mr John Widner and Mr Juhani Tuovinen
Templestowe Technical Teachers Bulletin Board
Templestowe Technical School
Cyprus Ave, Templestowe Vic
Phone: (03) 850-6333

Western Australia

Dr. L. Ann Clyde
Head of Library Studies
W.A. College of Advanced Education
Coner Sterling Highway & Hampden Road
Nedlands, W.A., 6009
Phone: (09) 387-9211; 386-0242.

Ms Clare Menkens
Superintedent of Education- Library Services
151 Royal St., East Perth
W.A.
Phone: (09) 420-4589

Prof. Michael Scriven
Department of Education
University of Western Australia
Nedlands, 6009
phone: (09) 380-3838

Phase 2 - In-depth Investigation of Services Provided

The names of the representatives of the services referred to throughout the study are listed here. Where we were able to contact some of the service users they are listed.

ACI Computer Services:

Service provider representative:
Ian McCallum
541 Blackburn Road
Mount Waverley Vic 3149
Phone: (03) 541-5600; 543-6166

Australian Education Index:

Ms Elizabeth Oley
Head Library and Information Services Unit
ACER
P.O. Box 210 Hawthorn, Vic. 3122
Phone: (03) 819-1400

ASCIS:

Service provider representative:
Ms Georgina Cane
Executive Director
ASCIS
Phone: (03) 348-1911

Mr Alan Ferguson
Education Officer
449 Swanston Street
Melbourne 3000
Phone: (03) 663-2866

Service Users:(several users are referred to in the next section 3.3 A)

COMET: Caulfield High School BBS

Service provider representative:
Peter Mc Robert
Caulfield High School
Caulfield Vic
Phone: (03) 211-7939; 211-7838

Service User:
Mr Juhani Tuovinen
Templestowe Technical School
Cyprus Ave, Templestowe Vic
phone: (03) 850-6333

"Corporate Report" from Australian Associated Press:

Service provider representative:
Frank Wheatland
AAP Information Services
351 Collins Street
Melbourne 3001
Phone: (03) 619-9300

Service User:
Mr Robert Aikenhead
Caulfield High School
Phone: (03) 211-7939; 211-7838

Mr Don Schauder
Librarian
Chisholm Institute of Technology
P O Box 197
Caulfield Vic 3145
Phone (03) 573-2157

Chisholm Institute of Technology Library uses computer services of AAP and lends out computers and computer services to students and school users (e.g., Caulfield High School).

MINERVA: AustralAlaskan Writing Project

Service Provider:
Mr Bob Murray
OTC Project Co-ordinator
Australaskan Writing Project
OTC Australia
G.P.O. Box 7000
Sydney, 2001
Phone: (02) 230-5763.

Director Australaskan Writing Project:
Mr Malcolm Beazley (Head of English Department)
Turramurra High School
Maxwell St. Turramurra NSW 2074
Phone: (02) 44-4654

Service User:
Mr Bruce Neale
Marybyrnong Primary School
Albega St. Kaleen, ACT
phone: (062) 41-3000

SOUTH AUSTRALIAN INDEPENDENT SCHOOLS BOARD COMPUTER NETWORK

Contact:
Mr L.D. Martin
Executive Officer
Independent Schools Board
301 Unley Road
Malvern SA 5061
phone: (08) 373-0755

Service Users:
Mr Greg Sharp & Mr John Eckerman
Immanuel College
32 Morphett Road
Nova Gardens SA 5040
Phone: (08) 294-3588

TELEDATA-EDUCATIONAL BBS (now ceased operations)

Service provider representative:
Mr Raymond Crawley
Sales Manager
24 Camberwell Road
Camberwell Vic 3123
Phone: (03) 813-1133

Co-ordinator:
Mr Neil Watkins
Computer Consultant
Catholic Education Centre
P O Box 222
Warragul 3820
Phone: (056) 231-720

Service User:
St Johns School (Catholic Primary)
Kooweerup Vic 3981
Phone: (059) 971-653

Telememo

Service provider representative:
Mr Vic Carboon
Education Coordinator
Telecom
7/172 William Street
Melbourne Vic 3000
Phone: (03) 606-8634

Dr Peter White
Educational Consultant
Department of Education
La Trobe University
Bundoora, Vic 3083
Phone: (03) 817-5875

Service Co-ordinator:
Ms Robin Bishop
Technology Officer
Distance Education
G.P.O. Box 7098
Sydney, NSW, 2001
phone: (02) 339-8444; 339-8436

Service Users:
(two distance education students were interrerviewed, see section 3.3 B)

VIATEL/EDUTEL

Service provider representative:
Ms Jenny Ambrozek
Instructional Services
Australian Caption Centre
1st level Fortune House
88-90 Foveaux Street
Surrey Hills N.S.W. 2010
Phone: (02) 212-5277

Service Users:
Mr Ed Brumby
Victoria College
221 Burwood Highway
Burwood Vic 3125
Phone: (03) 285-3352

Mr Vick Czernezkyj
Principal Education Officer
Northern Territory Computer Education Centre
Phone: (089) 850-357